

WHAT IS CLAIMED IS:

1. A detector for simultaneously detecting and identifying subtypes of human papilloma viruses (HPV) contained in a sample, comprising:

a carrier having a first part and a second part for carrying said sample thereon;

5 a first oligonucleotide carried on said first part of said carrier; and

a second oligonucleotide carried on said second part of said carrier,

wherein said first and second oligonucleotides respectively hybridized with deoxyribonucleic acids contained in a first subtype of human papilloma virus and a second subtype of human papilloma virus for simultaneously detecting and identifying subtypes of 10 human papilloma viruses.

2. The detector according to claim 1, wherein said carrier is made of nylon.

3. The detector according to claim 1, wherein said carrier is a glass plate.

4. The detector according to claim 1, wherein said first and second subtypes of human papilloma viruses are respectively selected from one of following viruses:

15 HPV 11 NC 001525

SEQ ID NO:

5'→ 3'

Locus in HPV

11

SEQ ID NO:1	ATCTGTGTCTAAATC	6799 - 6813
SEQ ID NO:2	TCTGTGTCTAAATCTGCTAC	6800 - 6819
SEQ ID NO:3	ATCTGTGTCTAAATCTGCTACATACA	6799 - 6824
SEQ ID NO:4	TGCATCTGTGTCTAAATCTG	6796 - 6815
SEQ ID NO:5	AAATCTGCTACATACACTAA	6809 - 6828
SEQ ID NO:6	CTAAATCTGCTACATACACTA	6807 - 6827
SEQ ID NO:7	CTACATACACTAATTCACTG	6816 - 6835
SEQ ID NO:8	TAGCATTACATTATCTGCAGAAG	6895 - 6917
SEQ ID NO:9	TCCTTCTGTTTGGAGGAC	6943 - 6961
SEQ ID NO:10	TTTATCGCCTCCACCAAATGGTACAC	6973 - 6998
SEQ ID NO:11	TTATAGATATGTACAGTCACAGGCC	7009 - 7033
SEQ ID NO:12	ACCCACACCTGAAAAAGAAAAAC	7048 - 7070
SEQ ID NO:13	GGCGGATGCTCATTATGCGACTG	1044 - 1066
SEQ ID NO:14	ATATGTAAGTCCTATAAGCAATGTAG	1101 - 1126
SEQ ID NO:15	CTAATGCAGTAGAAAGTGAGATAAGT	1127 - 1152
SEQ ID NO:16	CACGGTTAGACGCCATTAAACTTACA	1154 - 1179
SEQ ID NO:17	CACAGCCAAAAAAGTAAAGCGACGG	1181 - 1206
SEQ ID NO:18	GCAACGCAGGTAGAGAAACATGGCGA	1264 - 1289

SEQ ID NO:19	GAAAATGGGGGAGATGGTCAGGAAAGGGAC	1294 - 1323
SEQ ID NO:20	GACACAGGGAGGGACATAGAGGGTGA	1321 - 1346
SEQ ID NO:21	ACATAGAGAGGCAGAAGCAGTAGACG	1356 - 1381
SEQ ID NO:22	ACAGCACCCAGAGCATGCAGACACA	1382 - 1407
SEQ ID NO:23	TCAGGAATATTAGAATTACTAAAATG	1408 - 1433
SEQ ID NO:24	GCTGTCATTGTTGATT	1482 - 1500

HPV 16 NC 001526

SEQ ID NO:	5' → 3'	Locus in HPV 16
SEQ ID NO:25	TATGTCATTATGTGCTGCCA	6659 - 6678
SEQ ID NO:26	GTGCTGCCATATCTACTTCA	6670 - 6689
SEQ ID NO:27	TGCCATATCTACTTC	6674 - 6688
SEQ ID NO:28	TATCTACTTCAGAAACTACA	6679 - 6698
SEQ ID NO:29	CTACTTCAGAAACTACATATAA	6682 - 6703
SEQ ID NO:30	ATAAAAAATACTAACTTTAAG	6700 - 6719
SEQ ID NO:31	CAAAATAACCTTAAC TG CAGACG	6773 - 6795
SEQ ID NO:32	TTCCACTATTTGGAGGAC	6821 - 6839
SEQ ID NO:33	TCTACAA CCTCCCCCAGGAGGCACAC	6851 - 6876
SEQ ID NO:34	TTATAGGTTGTAA CCCCAG	6887 - 6905
SEQ ID NO:35	ACATACACCTCCAGCACCT	6923 - 6941
SEQ ID NO:36	CCTTAAAAAATACACT	6956 - 6971
SEQ ID NO:37	AGCAAAACAACATAGAGATGCAG	1089 - 1111
SEQ ID NO:38	ACTTAGTGTATTAGGGATGTGTAG	1145 - 1170
SEQ ID NO:39	TAGTCCTAGATTAAAAGCTATGTATAG A	1181 - 1210
SEQ ID NO:40	AAAAAACAAAGTAGAGCTGCAAAAG	1209 - 1234
SEQ ID NO:41	CTCAGCAGATGTTACAGGTAGAAGGG	1285 - 1310
SEQ ID NO:42	CCATGAGACTGAAACACCATGTAGTC	1313 - 1338
SEQ ID NO:43	GGGGGTGGTTGCAGTCAGTACAGTAG	1356 - 1381
SEQ ID NO:44	GTGGGGGAGAGGGTGTAGTGAAGAGA	1387 - 1412
SEQ ID NO:45	CTATATGCCAAACACCACTTACAAAT	1417 - 1442
SEQ ID NO:46	GTTATACGGGGTGAGTTTCAGAAT	1502 - 1527

5 **HPV 18 NC 001357**

SEQ ID NO:	5' → 3'	Locus in HPV 18
SEQ ID NO:47	TTCTACACAGTCTCC	6650 - 6664
SEQ ID NO:48	CAGTCTCCTGTACCTGGGCA	6657 - 6676
SEQ ID NO:49	AGTCTCCTGTACCTGGGCAA	6658 - 6677
SEQ ID NO:50	TCTCCTGTACCTGGGCAATATGA	6660 - 6682
SEQ ID NO:51	CTGTACCTGGGCAATATGAT	6664 - 6683
SEQ ID NO:52	ATGATGCTACCAAATTAAAG	6679 - 6698
SEQ ID NO:53	TACTATTACTTAAC TG CAGATG	6752 - 6774

SEQ ID NO:54	TAGCAGTATTAGAGGAT	6800 – 6818
SEQ ID NO:55	TGTTCCCCCCCCCAACTACTAGTT	6830 – 6855
SEQ ID NO:56	ATATCGTTGTACAATCTGTT	6866 – 6887
SEQ ID NO:57	GGATGCTGCACCGGCTGAA	6905 – 6923
SEQ ID NO:58	CTATGATAAGTTAAAG	6935 – 6950
SEQ ID NO:59	GGTCCACAATGATGCACAAGTGT	1135 - 1157
SEQ ID NO:60	CACAGAAAACAGTCCATTAGGGGAGC	1192 - 1217
SEQ ID NO:61	GCTGGAGGTGGATACAGAGTTAAGTC	1219 - 1244
SEQ ID NO:62	AGTGGGCAGAAAAAGGCAAAAAGGCGGCT	1271 - 1300
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SEQ ID NO:63	CACAGATTCAAGGTAACATACAAATGGC	1347 - 1372
SEQ ID NO:64	CAATGTATGTAGTGGCGGCAGTACGG	1384 - 1409
SEQ ID NO:65	GACAACGGGGGCACAGAGGGCAACAA	1418 - 1443
SEQ ID NO:66	GTAGACGGTACAAGTGACAATAGCAA	1451 - 1476
SEQ ID NO:67	CCACAATGTACCATAGCACAATTAAA	1493 - 1518
SEQ ID NO:68	CACATATGGCTATCATTACAGATT	1573 - 1598

HPV 26 NC 001583

SEQ ID NO:	5' → 3'	Locus in HPV 26
SEQ ID NO:69	TAGTACATTATCTGCAGCAT	6619 – 6638
SEQ ID NO:70	ATTATCTGCAGCATC	6625 – 6639
SEQ ID NO:71	TGCAGCATCTGCATCCACTC	6631 – 6650
SEQ ID NO:72	GCATCTGCATCCACTCCATTAAA	6635 – 6658
SEQ ID NO:73	CTCCATTAAACCATCTGAT	6648 – 6667
SEQ ID NO:74	TAAAATAACACTTACAACAGATG	6727 – 6749
SEQ ID NO:75	TGCCTCCATATTGGAGGAT	6775 – 6793
SEQ ID NO:76	ACTAACCTTACCTCCACTGCTAGTT	6805 – 6830
SEQ ID NO:77	CTATAGGTTATTAAAAACTCT	6841 – 6862
SEQ ID NO:78	TAACGCCCTCCTGTGCCA	6880 – 6898
SEQ ID NO:79	AAAACAGGCAAATACAAAGGCAG	1093 - 1115
SEQ ID NO:80	CTAGGTAGTCAGAACAGCCCCGTGCA	1139 - 1164
SEQ ID NO:81	GCGACAGTCAGCAGAACATACACACCAAGTAA	1194 - 1223
SEQ ID NO:82	CAAAAGGAGAGCCGTGGACAGTGTAC	1237 - 1262
SEQ ID NO:83	CCGTACAGGTAGATAAACAAATATGAA	1305 - 1330
SEQ ID NO:84	GCCTAGTGTGTAGTCAGGGGGGG	1345 - 1369
SEQ ID NO:85	GCCTCAGTGGAAAGATATCGATGTAGA	1376 - 1401
SEQ ID NO:86	CAGTGTACACAAATATGTGAATTAT	1414 - 1439
SEQ ID NO:87	CAGTATATGGTGTAAAGTTGCAGAA	1485 - 1510

5 **HPV 31 NC 001527**

SEQ ID NO:	5' → 3'	Locus in HPV 31
SEQ ID NO:88	TGCAATTGCAAACAG	6592 – 6606

SEQ ID NO:89	GCAATTGCAAACAGTGATAC	6593 – 6612
SEQ ID NO:90	CAATTGCAAACAGTGATACT	6594 – 6613
SEQ ID NO:91	GCAAACAGTGATACTACATTAA	6599 – 6621
SEQ ID NO:92	CTACATTTAAAAGTAGTAAT	6612 – 6631
SEQ ID NO:93	CAAAATAACATTATCTGCAGACA	6691 – 6713
SEQ ID NO:94	TCCTGCTATTTGGAAGAT	6739 – 6757
SEQ ID NO:95	ATTGACCACACCTCCCTCAGGTTCTT	6769 – 6794
SEQ ID NO:96	CTATAGGTTGTCACCTCACAG	6805 – 6826
SEQ ID NO:97	AACTGCCCCCCAAAAGCCC	6844 – 6862
SEQ ID NO:98	AGCGGAGGAACATGCAGAGGCTG	1083 - 1105
SEQ ID NO:99	TTTAAGTGTATTAGTAGTTGTGG	1140 - 1165
SEQ ID NO:100	AGTCCACGGTTAAAAGCTATATGCATAGAA	1177 - 1206
SEQ ID NO:101	GACTCTTGAACCTCCAGACAGCGGG	1232 - 1257
SEQ ID NO:102	GCAGCAGATGGTACAGGTAGAGGAGC	1281 - 1306
SEQ ID NO:103	AATGGTAGTGACGGGACACATAGTGA	1327 - 1352
SEQ ID NO:104	CCAACACGTAATATATTGCAAGTGT	1369 - 1394
SEQ ID NO:105	GCAATGGTAAAGCTGCTATGTTAGGT	1403 - 1428
SEQ ID NO:106	TTATATGGTGTAAAGTTTATGGAAC	1441 - 1465

HPV 32 NC 001586

SEQ ID NO:	5' → 3'	Locus in HPV 32
SEQ ID NO:107	TGCTACTGTAACAACTGAAG	6906 – 6925
SEQ ID NO:108	GCTACTGTAACAACTGAAGA	6907 – 6926
SEQ ID NO:109	TACTGTAACAACTGA	6909 – 6923
SEQ ID NO:110	ACTGTAACAACTGAAGACAC	6910 – 6929
SEQ ID NO:111	CAACTGAAGACACATACAAGTC	6917 – 6938
SEQ ID NO:112	CAAAATTACATTATCTGTAGAGG	7005 – 7027
SEQ ID NO:113	TCCTGACATACTAGACGAT	7053 – 7071
SEQ ID NO:114	TGTAGCTCCACCGCCCTCTGGTACTT	7083 – 7108
SEQ ID NO:115	TTATAGATTGTGCAGTCTCAG	7119 – 7140
SEQ ID NO:116	TAAGGTAACAGCACCTGAA	7158 – 7176
SEQ ID NO:117	TTTTCTGACTATTCA	7188 – 7203
SEQ ID NO:118	AGCACATGCAGATAAGGAGGCAG	1062 - 1084
SEQ ID NO:119	GGCAGTCCATATGAAAGTCCGCCAGTGAT	1111 - 1140
SEQ ID NO:120	GAGCTAAGCCCTAGGCTTGGTGGATT	1162 - 1187
SEQ ID NO:121	GGGGCAAACGACGACTATTCAATC	1210 - 1235
SEQ ID NO:122	GCAGGAACAGGTAGAAAATGGACATG	1284 - 1309
SEQ ID NO:123	GTGTACATGGGGTGCAGGAAAATCAG	1352 - 1377
SEQ ID NO:124	GCCTACAAACAAGGGTGGTGGATTGC	1395 - 1420
SEQ ID NO:125	GCAAGCAACATTGTTAGGTAAGTTA	1437 - 1462
SEQ ID NO:126	GCTGTTGGATTGTCATTGGTGATT	1467 - 1492

HPV 33 NC 001528

SEQ ID NO:	5' → 3'	Locus in HPV 33
SEQ ID NO:127	TATGCACACAAGTAACTAGT	6624 – 6643
SEQ ID NO:128	CACACAAGTAACTAG	6628 – 6642
SEQ ID NO:129	ACAAGTAACTAGTGACAGTA	6631 – 6650
SEQ ID NO:130	GTAACTAGTGACAGTACATATAA	6635 – 6657
SEQ ID NO:131	GTACATATAAAAATGAAAAT	6648 – 6667
SEQ ID NO:132	CAAAGTTACCTTAAC TG CAGAAG	6727 – 6749
SEQ ID NO:133	TCCAGATATTTAGAAGAT	6775 – 6793
SEQ ID NO:134	TTAACACCTCCTCCATCTGCTAGTT	6805 – 6830
SEQ ID NO:135	CTATAGGTTGTTACCTCTCAG	6841 – 6862
SEQ ID NO:136	AACAGTACCTCCAAAGGAA	6880 – 6898
SEQ ID NO:137	CTTAGGTAAATATACA	6910 – 6925
SEQ ID NO:138	AGGGGAGGATGATTAAATGCTG	1100 - 1122
SEQ ID NO:139	GCATGTTCACAAAGTGCTGCGGAGGA	1149 - 1174
SEQ ID NO:140	GATCGTGTGCAAACCCGTGTAGAAC	1182 - 1207
SEQ ID NO:141	GAATGCACATACAGAAAACGAAAAATAGAT	1227 - 1256
SEQ ID NO:142	AAATAGATGAGCTAGAAGACAGCGGA	1249 - 1274
SEQ ID NO:143	GGTACAACAGGTAGAAAGTCAAAATG	1307 - 1332
SEQ ID NO:144	GACTAGAATCTAGTGGGGTGGGGGA	1350 - 1357
SEQ ID NO:145	CTGTGAGACAAATGTAGATAGCTGTG	1391 - 1416
SEQ ID NO:146	CGTTGCAGGAAATTAGTAATGTTCTA	1426 - 1451
SEQ ID NO:147	GAGGCCTATGGAATAAGTTTAT	1494 - 1516

HPV 35 NC 001529

SEQ ID NO:	5' → 3'	Locus in HPV 35
SEQ ID NO:148	TCTGCTGTGTCTTCTAGTGA	6612 – 6631
SEQ ID NO:149	TGCTGTGTCTTCTAG	6614 – 6628
SEQ ID NO:150	GTGTCTTCTAGTGACAGTAC	6618 – 6637
SEQ ID NO:151	CTTCTAGTGACAGTACATATAAA	6622 – 6644
SEQ ID NO:152	GTACATATAAAAATGACAAT	6634 – 6653
SEQ ID NO:153	TAAAATAACACTAACAGCAGATG	6713 – 6735
SEQ ID NO:154	CCCGTCCATTAGAGGAT	6761 – 6779
SEQ ID NO:155	CCTTACACCACCGCCTCTGGTACCT	6791 – 6816
SEQ ID NO:156	ATATCGCTATGTAACATCACAG	6827 – 6848
SEQ ID NO:157	ACCCAGTGCACCAAAACCT	6866 – 6884
SEQ ID NO:158	GGAGCAAACACACAAAGAGGCTG	1089 - 1111
SEQ ID NO:159	GCAGCGTGAGCTTATGTGTTAATAATAACA	1151 - 1180
SEQ ID NO:160	GTCCACGTTAAAAGCTATTGCA	1184 - 1207
SEQ ID NO:161	CGATTATTGAACTACCAAGACAGCGG	1237 - 1262
SEQ ID NO:162	GAGATACAACAGGTAGAGGGGCATGA	1291 - 1316
SEQ ID NO:163	GGGCAGTGGGGATAGTATAACCTCTA	1338 - 1363
SEQ ID NO:164	GACATGATGAGACTCCAACGCGAGAC	1376 - 1401

SEQ ID NO:165	CTAAAATGTAGTAATGCAAACGCAGC	1414 - 1439
SEQ ID NO:166	GCTATGTTGGCTAAATTAAAGAACT	1438 - 1463

HPV 37 NC 001687

SEQ ID NO:	5' → 3'	Locus in HPV 37
SEQ ID NO:167	TGTCTACTGACAATG	6782 - 6796
SEQ ID NO:168	TGTCTACTGACAATGGCGAA	6782 - 6801
SEQ ID NO:169	TGACAATGGCGAAGTTACAG	6789 - 6808
SEQ ID NO:170	GACAATGGCGAAGTTACAGA	6790 - 6809
SEQ ID NO:171	AATGGCGAAGTTACAGAATA	6793 - 6812
SEQ ID NO:172	CAGAATATAATTCTCAAACA	6806 - 6825
SEQ ID NO:173	TAAAGTTCCCTTAAAGGCTGAGG	6885 - 6907
SEQ ID NO:174	TTCTGGTATATTGGAAGAG	6933 - 6951
SEQ ID NO:175	ATTGTACCTACTCCAGATAATTCA	6963 - 6988
SEQ ID NO:176	TTATAGGTACATTAATTCAAAG	6999 - 7020
SEQ ID NO:177	TGCAGTTGTTGAAAAAGAA	7038 - 7056
SEQ ID NO:178	CTTGCAAAATATACA	7068 - 7083

HPV 39 NC 001535

SEQ ID NO:	5' → 3'	Locus in HPV 39
SEQ ID NO:179	CTCTATAGAGTCTTC	6677 - 6691
SEQ ID NO:180	TAGAGTCTTCCATACCTTCT	6682 - 6701
SEQ ID NO:181	ATAGAGTCTTCCATACCTTC	6681 - 6700
SEQ ID NO:182	GTCTTCCATACCTTCTACATATG	6686 - 6708
SEQ ID NO:183	CTACATATGATCCTTCTAAG	6700 - 6719
SEQ ID NO:184	TAATGTCACATTAACAACGTGATG	6779 - 6801
SEQ ID NO:185	TTCCTCTATATTGGACAA	6827 - 6844
SEQ ID NO:186	TGTAGCTCCTCCACCATCTGCCAGTT	6857 - 6882
SEQ ID NO:187	TTACAGATAACCTACAGTCTGCA	6893 - 6914
SEQ ID NO:188	GGATGCTCCAGCACCTGAA	6932 - 6950
SEQ ID NO:189	ATATGACGGTCTAAAG	6962 - 6977
SEQ ID NO:190	GGCCCAAAGGGATGCACAAGCAG	1149 - 1171
SEQ ID NO:191	CAGACAGCAGTGGCGACACTAGACCGTATG	1196 - 1225
SEQ ID NO:192	GTAGGCAGGAATACCAGGGAAACAC	1234 - 1258
SEQ ID NO:193	GCAGTACGCAGGCAACACAAACGGTG	1283 - 1308
SEQ ID NO:194	GGAGGAGGTAAGTGTAGCAACTAATA	1362 - 1387
SEQ ID NO:195	CATGGCGGCAGTGTACGGGAGGAGTG	1411 - 1436
SEQ ID NO:196	GGATAGTGCTATAGATAGTGAAAACC	1446 - 1471
SEQ ID NO:197	CTCCAACGTGACAAATTAAATTATTG	1484 - 1509
SEQ ID NO:198	CCAATAACAAAAAGGCTGCAATGCTA	1517 - 1542

HPV 42 NC 001534

SEQ ID NO:	5' → 3'	Locus in HPV 40
SEQ ID NO:199	TGCCACTACACAGTC	6719 – 6733
SEQ ID NO:200	CTACACAGTCCCCTCCGTCT	6724 – 6743
SEQ ID NO:201	TGCCACTACACAGTCCCCTC	6719 – 6738
SEQ ID NO:202	CAGTCCCCTCCGTCTACATATA	6729 – 6750
SEQ ID NO:203	CTACATATACTAGTGAACAA	6742 – 6761
SEQ ID NO:204	TAGTATTACCTAACGGCGGAGG	6821 – 6843
SEQ ID NO:205	TGCTGGTATTTAGAACAG	6869 – 6887
SEQ ID NO:206	GTTGTCGCCGCCCCAAATGGTACCT	6899 – 6924
SEQ ID NO:207	ATACAGATATGTGCAGTCCCAG	6935 – 6956
SEQ ID NO:208	GCCACCCCTGAAAAGGCA	6974 – 6992
SEQ ID NO:209	CTATGAAAATTAAGT	7004 – 7019
SEQ ID NO:210	GGCGGATGCTCATTATGCGGCTG	1038 – 1060
SEQ ID NO:211	GGTAGTCCATATGTTAGTCCTTAAGTAA	1087 – 1116
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SEQ ID NO:212	CACGGCTGGACGCTATAACATTAAGT	1148 – 1173
SEQ ID NO:213	GACGGCTTTGACAGACCAGAAATTA	1196 – 1221
SEQ ID NO:214	GCTGAAACGCAGGTAGAGAGAAATGG	1255 – 1280
SEQ ID NO:215	GGGAGGTGGACAAGGAAGGGACACAG	1299 – 1324
SEQ ID NO:216	GGAAGTGCAGACACATAGAACACAC	1347 – 1372
SEQ ID NO:217	GGTACTAGAACTATTGAAATGTAAGA	1395 – 1420
SEQ ID NO:218	GCTTGGTAAGTTAAGGATTGCTATG	1437 – 1462

HPV 43 U12504

SEQ ID NO:	5' → 3'	Locus in HPV 43
SEQ ID NO:637	CATTGTTTGGGAATCAGTTG	21 - 42
SEQ ID NO:638	TGACCTACTGTGCCAGTA	99 - 118
SEQ ID NO:639	ACTGTGCCAGTACATATGACAATGCAAA	106 - 135
	G	
SEQ ID NO:640	GTTTATATTCAATTATGCATAA	177 - 199
SEQ ID NO:641	CCAGAGGTATGACATATATT	211 – 231
SEQ ID NO:642	CCCACATTATTAGAGGACTGGAA	244 - 266
SEQ ID NO:643	CCACCTGCCTCTGCTTCTTG	280 - 300
SEQ ID NO:644	CGCTTTGTCTAACAAAGGCCATTG	313 – 337
SEQ ID NO:645	CCAAAGGAACGGGAGGATCCCTA	358 - 380
SEQ ID NO:646	CTTACAGAAAAGTTCTGCACAAAC	409 - 433

5 **HPV 44 NC 001689**

SEQ ID NO:	5' → 3'	Locus in HPV 40
SEQ ID NO:199	TGCCACTACACAGTC	6719 – 6733
SEQ ID NO:200	CTACACAGTCCCCTCCGTCT	6724 – 6743

SEQ ID NO:201	TGCCACTACACAGTCCCCTC	6719 – 6738
SEQ ID NO:202	CAGTCCCCTCCGTCTACATATA	6729 – 6750
SEQ ID NO:203	CTACATATACTAGTGAACAA	6742 – 6761
SEQ ID NO:204	TAGTATTACCTAACGGCGGAGG	6821 – 6843
SEQ ID NO:205	TGCTGGTATTTAGAACAG	6869 – 6887
SEQ ID NO:206	GTTGTCGCCGCCAAATGGTACCT	6899 – 6924
SEQ ID NO:207	ATACAGATATGTGCAGTCCCAG	6935 – 6956
SEQ ID NO:208	GCCACCCCCCTGAAAAGGCA	6974 – 6992
SEQ ID NO:209	CTATGCAAAATTAAGT	7004 – 7019
SEQ ID NO:210	GGCGGATGCTCATTATGCGGCTG	1038 – 1060
SEQ ID NO:211	GGTAGTCCATATGTTAGTCCTTAAGTAAT	1087 – 1116
SEQ ID NO:212	CACGGCTGGACGCTATAACATTAAGT	1148 – 1173
SEQ ID NO:213	GACGGCTGTTGACAGACCCAGAATTA	1196 – 1221
SEQ ID NO:214	GCTGAAACGCAGGTAGAGAGAAATGG	1255 – 1280
SEQ ID NO:215	GGGAGGTGGACAAGGAAGGGACACAG	1299 – 1324
SEQ ID NO:216	GGAAGTGCAGACACATAGAACACAC	1347 – 1372
SEQ ID NO:217	GGTACTAGAACTATTGAAATGTAAGA	1395 – 1420
SEQ ID NO:218	GCTTGGTAAGTTAAGGATTGCTATG	1437 – 1462

HPV 45 NC 001590

SEQ ID NO:	5' → 3'	Locus in HPV 45
SEQ ID NO:219	TGCCTCTACACAAAAATCCTG	6651 – 6670
SEQ ID NO:220	CTCTACACAAAAATCC	6654 – 6668
SEQ ID NO:221	ACAAAAATCCTGTGCCAAGTA	6660 – 6679
SEQ ID NO:222	CAAAATCCTGTGCCAAGTAC	6661 – 6680
SEQ ID NO:223	AATCCTGTGCCAAGTACATATG	6664 – 6685
SEQ ID NO:224	GTACATATGACCCTACTAAG	6677 – 6696
SEQ ID NO:225	CACTATTACTTAACTGCAGAGG	6756 – 6778
SEQ ID NO:226	TAGTAGTATATTAGAAAAT	6804 – 6822
SEQ ID NO:227	TGTCCCTCCACCACTACTACAAGTT	6834 – 6859
SEQ ID NO:228	ATATCGTTTGTGCAATCAGTT	6870 – 6891
SEQ ID NO:229	GGATACTACACCTCCAGAA	6909 – 6927
SEQ ID NO:230	AGTCAGAATGATGCACAGGTGT	1135 – 1157
SEQ ID NO:231	GCAGCTAAGTGTGGATACGGATCTAAGTC	1216 – 1245
	C	
SEQ ID NO:232	CAAGAAATTCTATTAATAGTGGGCA	1253 – 1278
SEQ ID NO:233	ACGGTTGTTACAATATCAGATAGT	1294 – 1319
SEQ ID NO:234	CATAGTACACAAAGTAGTGGTGGGGA	1397 – 1422
SEQ ID NO:235	GACAATGCAGAAAATGTAGATCCGCA	1430 – 1455
SEQ ID NO:236	GGAGCTATTACAAGCAAGTAACAAAA	1477 – 1502
SEQ ID NO:237	GCAATGCTGGCAGTATTAAAGACA	1508 – 1532
SEQ ID NO:238	ATATGGGCTGTCATTACGGATTGG	1534 – 1559

HPV 51 NC 001533

SEQ ID NO:	5' → 3'	Locus in HPV 51
SEQ ID NO:239	CACTGCCACTGCTGCGGTTT	6555 – 6574
SEQ ID NO:240	TGCCACTGCTGCGGT	6558 – 6572
SEQ ID NO:241	CACTGCTGCGGTTCCCCAA	6561 – 6580
SEQ ID NO:242	CCACTGCTGCGGTTCCCCA	6560 – 6579
SEQ ID NO:243	CTGCGGTTCCCCAACATTAC	6566 – 6587
SEQ ID NO:244	CAACATTTACTCCAAGTAAC	6578 – 6597
SEQ ID NO:245	TAAAATTACTTAACTACAGAGG	6657 – 6679
SEQ ID NO:246	TCCTACCATTCTTGAACAG	6705 – 6723
SEQ ID NO:247	ATTAACATTACCTCCGTCTGCTAGTT	6735 – 6760
SEQ ID NO:248	ATATAGGTTGTTAGAAATGCA	6771 – 6792
SEQ ID NO:249	GGACACCCCTCCACAGGCT	6810 – 6828
SEQ ID NO:250	TTTGGCCAATATAAAA	6840 – 6855
SEQ ID NO:251	ATTACAGGCCAAACAAAGAGGCTG	1092 – 1114
SEQ ID NO:252	GCGAAGCAGCCCATTAGGAGACATTACAA	1149 – 1178
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SEQ ID NO:253	CCATAGTCAGGCAAACGAGTCACAAG	1197 – 1222
SEQ ID NO:254	AGATTACTGGACAGTTATCCGGACA	1231 – 1255
SEQ ID NO:255	CAGGTAGATGGGCAACATGGCGGTT	1300 – 1325
SEQ ID NO:256	AGCTGTGCAAATGTAGAACTAACAG	1384 – 1409
SEQ ID NO:257	GGTATTAGTTATAATGAGTTGGTACG	1477 – 1502

HPV 52 NC 001592

SEQ ID NO:	5' → 3'	Locus in HPV 52
SEQ ID NO:258	TGAGGTTAAAAAGGA	6695 – 6709
SEQ ID NO:259	TGAGGTTAAAAAGGAAAGCA	6695 – 6714
SEQ ID NO:260	GAGGTTAAAAAGGAAAGCAC	6696 – 6715
SEQ ID NO:261	TTAAAAAGGAAAGCACATAT	6700 – 6719
SEQ ID NO:262	AAAGGAAAGCACATATAAAAAT	6704 – 6725
SEQ ID NO:263	GCACATATAAAAATGAAAAT	6712 – 6731
SEQ ID NO:264	CAAAATTACATTAACAGCTGATG	6791 – 6813
SEQ ID NO:265	TGCCACTATTTAGAGGAC	6839 – 6857
SEQ ID NO:266	CCTTACCCCACCACCGTCTGCATCTT	6869 – 6894
SEQ ID NO:267	ATACAGATTGTCACTTCTACT	6905 – 6926
SEQ ID NO:268	AAACACACCACCTAAAGGA	6944 – 6962
SEQ ID NO:269	TTTAAAGGACTATATG	6974 – 6989
SEQ ID NO:270	AGGGGAGGATGATTACATGCTG	1085 – 1107
SEQ ID NO:271	GCAGTCCGGAAAGTGTGGCAAGATGGT	1135 – 1164
	G	
SEQ ID NO:272	GGTAGTCCCGCGTGCAAAACACATTG	1176 – 1201
SEQ ID NO:273	CCAAAACGCAAACCATGTCACGTAGA	1224 – 1249
SEQ ID NO:274	CAAAATGGCGACTGGCAAAGTA	1311 – 1332
SEQ ID NO:275	GCTAGTAATTCAAGATGTAAGTTGTAC	1359 – 1384

SEQ ID NO:276	GAGGAAAATAGTAATAGAACGCTAAA	1401 – 1426
SEQ ID NO:277	GCGAAAATAGCATAAAAACAACGTGA	1447 – 1472
SEQ ID NO:278	AGAAACATATGGTGTTAGCTTATGG	1487 – 1512

HPV 53 NC 001593

SEQ ID NO:	5' → 3'	Locus in HPV 53
SEQ ID NO:279	TCCGCAACCACACAGTCTAT	6681 – 6700
SEQ ID NO:280	CCGCAACCACACAGT	6682 – 6696
SEQ ID NO:281	CCGCAACCACACAGTCTATG	6682 – 6701
SEQ ID NO:282	CACAGTCTATGTCTACATATAA	6691 – 6712
SEQ ID NO:283	CTACATATAATTCAAAGCAA	6703 – 6722
SEQ ID NO:284	TAAAATATCCCTGTCTGCTGAGG	6782 – 6804
SEQ ID NO:285	TTCTACCTTACTGGAAGAC	6830 – 6848
SEQ ID NO:286	TTTGTGCGCCTCCTGTTGCCACTAGCT	6860 – 6885
SEQ ID NO:287	ATACAGATATGTGAAAAGTGCA	6896 – 6917
SEQ ID NO:288	GGATCAGCCCCCTCCTGAA	6935 – 6953

HPV 54 NC 001676

SEQ ID NO:	5' → 3'	Locus in HPV 54
SEQ ID NO:289	TACAGCATCCACGCA	6633 – 6647
SEQ ID NO:290	CAGCATCCACGCAGGATAGC	6635 – 6654
SEQ ID NO:291	ACGCAGGATAGCTTAATAA	6643 – 6662
SEQ ID NO:292	CACGCAGGATAGCTTAATA	6642 – 6661
SEQ ID NO:293	ATAGCTTAATAATTCTGAC	6650 – 6669
SEQ ID NO:294	TACCATAACCTTACAGCAGATG	6729 – 6751
SEQ ID NO:295	TCCCCTATTCTAGAGGAC	6777 – 6795
SEQ ID NO:296	TATAACCCCCCAGCTACAAGTAGTT	6807 – 6832
SEQ ID NO:297	ATATAGGTTGTACAGTCACAG	6843 – 6864
SEQ ID NO:298	GAATAATGCCCTGCAAAGGAA	6882 – 6903
SEQ ID NO:299	GCTGCAGGCAGATGTAGAGGCAG	1043 – 1065
SEQ ID NO:300	CGTATGTAAGTCCTGTTGCAAACAGCGAA	1099 – 1128
	C	
SEQ ID NO:301	CTGTGTAGAAAAGGACCTAA	1130 – 1149
SEQ ID NO:302	TATATCCCTAGGACGGCGGTAGCCA	1166- 1191
SEQ ID NO:303	GGTAAATACCGAGGGGACAGATGAAA	1265 – 1290
SEQ ID NO:304	GAAACAACTACAGATAGCCTAGGAAG	1323 – 1348
SEQ ID NO:305	CGTGTAGCATTGTTGGTATGTTAA	1386 – 1411
SEQ ID NO:306	TATGGATTAAGTTTATGGACC	1419 – 1440

5

HPV 56 NC 001594

SEQ ID NO:	5' → 3'	Locus in HPV 56
SEQ ID NO:307	CTGCTACAGAACAGT	6630 – 6644

SEQ ID NO:308	GCTACAGAACAGTTAAGTAA	6632 – 6651
SEQ ID NO:309	CAGAACAGTTAAGTAAATAT	6636 – 6655
SEQ ID NO:310	GAACAGTTAAGTAAATATGATGC	6638 – 6660
SEQ ID NO:311	GTAAATATGATGCACGAAAA	6648 – 6667
SEQ ID NO:312	CAAAATTACTTGTCTGCAGAGG	6727 – 6749
SEQ ID NO:313	TGCTAACCTACTGGAGGAC	6775 – 6793
SEQ ID NO:314	GTTATCCCCGCCAGTGGCCACCAGCC	6805 – 5830
SEQ ID NO:315	ATATAGATATGTTAGAACGACA	6841 – 6862
SEQ ID NO:316	GGAACAGCCACCAACAGAA	6880 – 6898

HPV 58 NC 001443

SEQ ID NO:	5' → 3'	Locus in HPV 58
SEQ ID NO:317	ATGCACTGAAGTAACTAAGG	6674 – 6693
SEQ ID NO:318	CACTGAAGTAACTAAGGAAG	6677 – 6696
SEQ ID NO:319	TGAAGTAACTAAGGA	6680 – 6694
SEQ ID NO:320	GAAGTAACTAAGGAAGGTAC	6681 – 6700
SEQ ID NO:321	CTAAGGAAGGTACATATAAAAA	6688 – 6709
SEQ ID NO:322	ATAAAAATGATAATTTAAG	6703 – 6722
SEQ ID NO:323	CAAAATTACACTAACTGCAGAGA	6776 – 6798
SEQ ID NO:324	TTCCAATATTTGGAGGAC	6824 – 6842
SEQ ID NO:325	TTTAACACCTCCTCCGTCTGCCAGTT	6854 – 6879
SEQ ID NO:326	ATATAGATTGTTACCTCCCAG	6890 – 6911
SEQ ID NO:327	AACAGCACCCCCTAAAGAA	6929 – 6947
SEQ ID NO:328	AGGGGTGGACGATATAATGCTG	1104 – 1126
SEQ ID NO:329	GCATGCTCAGAAAGTGCTGTAGA	1153 – 1175
SEQ ID NO:330	GCAAATGTGTGTATCGTGGAAATATAAA	1195 – 1224
SEQ ID NO:331	AAATTATTGAGCTAGAACAGACAG	1253 – 1274
SEQ ID NO:332	GCACACCAGGTAGAAAGCCAA	1312 – 1332
SEQ ID NO:333	GGCTAGTTAGATGTAAGCAGTGAAA	1377 – 1402
SEQ ID NO:334	GTAATATTCTACATAACAGTAA	1445 – 1466
SEQ ID NO:335	GCAACGCTATTATATAAAATTC	1474 – 1494
SEQ ID NO:336	GCTTATGGAGTAAGTTTATGGAA	1501 – 1524

5

HPV 59 NC 001635

SEQ ID NO:	5' → 3'	Locus in HPV 59
SEQ ID NO:337	TTCTACTACTTCTTC	6643 – 6657
SEQ ID NO:338	ACTACTTCTTCTATTCCCTAA	6647 – 6666
SEQ ID NO:339	ACTTCTTCTATTCCCTAATGT	6650 – 6669
SEQ ID NO:340	TCTTCTATTCCCTAATGTATACAC	6653 – 6675
SEQ ID NO:341	ATGTATACACACCTACCAGT	6666 – 6685
SEQ ID NO:342	TAAAATAACATTAACACAGAGG	6745 – 6767

SEQ ID NO:343	TACCACTATTTGGAGGAT	6793 – 6811
SEQ ID NO:344	TGTTACACCACCTCCTACTGCTAGTT	6823 – 6848
SEQ ID NO:345	ATACCGTTTGTTCATCTGCT	6859 – 6880
SEQ ID NO:346	GGACACCGCACCGCCAGTT	6898 – 6916
SEQ ID NO:347	TTATGACAAACTAAAG	6928 – 6943
SEQ ID NO:348	AGCCCAAAGGGATGCACGGGAAA	1093 – 1115
SEQ ID NO:349	GCAGTATAGAAAACAGTAGTGAGAAAGCG	1143 – 1172
	G	
SEQ ID NO:350	CCATTACAAGAAATATCAGTAAATG	1196 – 1220
SEQ ID NO:351	GGTTAATAACAGTGCCAGACAGCG	1245 – 1268
SEQ ID NO:352	GGTAACCGTGGAGAAATACTGGAAATG	1306 – 1331
SEQ ID NO:353	CTGTAGCGACAGCAGTAACATGGATG	1372 – 1397
SEQ ID NO:354	CCCACTAATCAATTGTTACAGTTA	1421 – 1444
SEQ ID NO:355	GGGTTATCATTTCAAGATTGG	1499 – 1520

HPV 61 NC 001694

SEQ ID NO:	5' → 3'	Locus in HPV 61
SEQ ID NO:356	CTGCTACATCCCCCCC	6803 – 6817
SEQ ID NO:357	ACATCCCCCCCCTGTATCTGA	6808 – 6827
SEQ ID NO:358	CATCCCCCCCCTGTATCTGAA	6809 – 6828
SEQ ID NO:359	CCCTGTATCTGAATATAAAGC	6815 – 6836
SEQ ID NO:360	CTGAATATAAAGCCACAAGC	6824 – 6843
SEQ ID NO:361	TAAAATACATTTAACCCCTGAAA	6903 – 6925
SEQ ID NO:362	TAAGGCCTTGTGGATGAC	6951 – 6969
SEQ ID NO:363	TGTGGTACCAACCACCCCTTACCAAGTT	6981 – 7006
SEQ ID NO:364	ATATAGGTTTTGCAGTCCAGA	7017 – 7038
SEQ ID NO:365	GGGTGCTGCTGCCCGCCGCC	7056 – 7077
SEQ ID NO:366	CTATGCCAAGTTATCC	7089 – 7104
SEQ ID NO:367	TGCACAGGATGACGCTGCAACGG	1038 – 1060
SEQ ID NO:368	CCTTGGTGGACAGTGAATTAAAGTCCC	1115 – 1140
SEQ ID NO:369	GGACAGGACAGGGCTAGGAGAAGGCT	1168 – 1197
	GT	
SEQ ID NO:370	TGTTGAGCAAGATAGTGGC	1193 – 1212
SEQ ID NO:371	GGATGCGCAACATGAGGGGGGGGGG	1263 – 1288
SEQ ID NO:372	GGCCGAGGCCACAGGTAAACCAGGAAA	1335 – 1360
SEQ ID NO:373	GGCAGACATATTAGAGGTGTTAAGG	1380 – 1405
SEQ ID NO:374	CTGTACAAATTCAAGGACCTATTG	1429 – 1454
SEQ ID NO:375	CTAGCATTGGGGAGCTGGTA	1456 – 1476

HPV 62 U12499

SEQ ID NO:	5' → 3'	Locus in HPV 62
SEQ ID NO:376	CCGCCTCCACTGCTG	92 – 106
SEQ ID NO:377	GCCTCCACTGCTGCAGCAGA	94 – 113

SEQ ID NO:378	CTGCTGCAGCAGAATACACG	101 – 120
SEQ ID NO:379	GCAGAATACACGGCTACCAA	109 – 128
SEQ ID NO:380	CAGAATACACGGCTACCAAC	110 – 129
SEQ ID NO:381	CAAAATACAGTTAACCCCCGAAA	189 – 211
SEQ ID NO:382	CAAGGACCTTTGGATGAC	237 – 255
SEQ ID NO:383	GGTTTACCTCCCCCTCCACTAGTT	267 – 292
SEQ ID NO:384	ATATCACTATTCGAGTCTCGG	303 – 324
SEQ ID NO:385	GGGGCTGCTACCCGTCCC	342 – 360
SEQ ID NO:386	GTATGCGCAAATGACA	372 – 387

HPV 66 NC 001695

SEQ ID NO:	5' → 3'	Locus in HPV 66
SEQ ID NO:387	CAGCTAAAAGCACAT	6680 – 6694
SEQ ID NO:388	CAGCTAAAAGCACATTAAC	6680 – 6699
SEQ ID NO:389	CTAAAAGCACATTAACAAA	6683 – 6702
SEQ ID NO:390	TTAACTAAATATGATGCCCG	6694 – 6713
SEQ ID NO:391	CTAAATATGATGCCCGTGAA	6698 – 6717
SEQ ID NO:392	TAAAATAACCTTAAC TGAGAAG	6777 – 6799
SEQ ID NO:393	TAATACTTTATTAGACGAT	6825 – 6843
SEQ ID NO:394	CTTATCCCCACCAGTTGCAACTAGCT	6855 – 6880
SEQ ID NO:395	ATATAGGTATATTAAAAGCACA	6891 – 6912
SEQ ID NO:396	GGAACAGCCCCCTGCAGAA	6930 – 6948
SEQ ID NO:397	CCTGGCTAAATATAAG	6960 – 6975
SEQ ID NO:398	AGCACATGCAGATGCACAGACG	1116 – 1137
SEQ ID NO:399	GGTAGTCCCTTAAGTGTATTTAGTAA	1165 – 1190
SEQ ID NO:400	GCAAACGTGTACCGAGAGGAAAGTAA	1194 – 1219
SEQ ID NO:401	AAGGCTAATATTATCAGAAGACAGCGGG	1224 – 1253
	TA	
SEQ ID NO:402	GAAACATCACAAACAGGTAGAATACG	1276 – 1300
SEQ ID NO:403	GAGCTCACAAAATGGAGGCTCGAAA	1320 – 1345
SEQ ID NO:404	ATCAAATATGGATATAGATACAAATA	1371 – 1396
SEQ ID NO:405	CCAATTGCAGGAACTATTTAAAAGTA	1413 – 1438
SEQ ID NO:406	CAAGGAAGATTACATTTAAATTAA	1447 – 1472
SEQ ID NO:407	AGAAGTGTATGGAGTGCCAT	1473 – 1492

5

HPV 67 D21208

SEQ ID NO:	5' → 3'	Locus in HPV 67
SEQ ID NO:408	CTGAGGAAAAATCAG	6655 – 6669
SEQ ID NO:409	GAGGAAAAATCAGAGGCTAC	6657 – 6676
SEQ ID NO:410	ATCAGAGGCTACATACAAAAATG	6665 – 6687

SEQ ID NO:411	AGGAAAAATCAGAGGCTACA	6658 – 6677
SEQ ID NO:412	CTACATACAAAAATGAAAAC	6673 – 6692
SEQ ID NO:413	CAAAATATCCCTTACTGCAAATG	6752 – 6774
SEQ ID NO:414	TCCAGATATATTAGAGGAC	6800 – 6818
SEQ ID NO:415	CCTTACACCACCTCCTCAGGTAATT	6830 – 6855
SEQ ID NO:416	ATATAGATTGTTACCTCGCAG	6866 – 6887
SEQ ID NO:417	AACATCCCCTCCAACAGCA	6905 – 6923
SEQ ID NO:418	TCTTAAAAAGTACAGT	6935 – 6950
SEQ ID NO:419	AGAGGAGGATGACCTAACGCTG	1096 – 1118
SEQ ID NO:420	CAGGCATGTGGTGGTAATAGTAATGG	1151 – 1176
SEQ ID NO:421	GCCGCAAAACGCAGAGCATACGACATA GAA	1199 – 1228
SEQ ID NO:422	GGCAAAATGGCGATATGCAGTGCAGT	1287 – 1312
SEQ ID NO:423	GCAAGTAGTACGGAAACAGTGTAGA	1331 – 1356
SEQ ID NO:424	GTCAGGAACAAAGCATGCCATTGCAA	1380 – 1405
SEQ ID NO:425	GCATGTAAATAATATAAAGGCAACG	1423 – 1447
SEQ ID NO:426	GGAAGCATATGGGTAACGTTACAC	1465 – 1490

HPV 68 M73258

SEQ ID NO:	5' → 3'	Locus in HPV 68
SEQ ID NO:427	CTACTACTGAATCAG	2653 – 2667
SEQ ID NO:428	TGAATCAGCTGTACCAAATA	2660 – 2679
SEQ ID NO:429	GAATCAGCTGTACCAAATAAT	2661 – 2680
SEQ ID NO:430	CAGCTGTACCAAATAATTATGA	2665 – 2686
SEQ ID NO:431	ATATTATGATCCTAATAAA	2677 – 2696
SEQ ID NO:432	TCCTGCTATTTGGATGAT	2804 – 2822
SEQ ID NO:433	TAATATAACATTGTCCACTGATG	2756 – 2778
SEQ ID NO:434	TGTTGCCCTCCACCATCTGCTAGTC	2834 – 2859
SEQ ID NO:435	ATACCGCTATCTGCAATCAGCA	2870 – 2891
SEQ ID NO:436	AGACGCCCTGCACCTACT	2909 – 2927
SEQ ID NO:437	ATATGATGGCTTAAAC	2939 – 2954
SEQ ID NO:438	GGCCCAAAGGGATGCACAAACAG	4990 – 5012
SEQ ID NO:439	GCCCTTAGCAAAGTCGCCATTACAG	5055 – 5080
SEQ ID NO:440	GGTAACTGTAGCAACTAATA	5115 – 5134
SEQ ID NO:441	GGAAAATGGCGACAGCATACGGGAGGAC TG	5163 – 5192
SEQ ID NO:442	GACAGTGCTATAGATAGTGAAAACCA	5203 – 5228
SEQ ID NO:443	CCTACTACGCAACTAAAAGTATTA	5242 – 5265
SEQ ID NO:444	AAGCTGCAATGTTAACAGAATTAAA	5285 – 5310

HPV 69 NC 002171

SEQ ID NO:	5' → 3'	Locus in HPV 69
SEQ ID NO:445	TATTAGTACTGTATCTGCAC	6572 – 6591

SEQ ID NO:446	CTGTATCTGCACAAT	6580 – 6594
SEQ ID NO:447	CTGTATCTGCACAATCTGCA	6580 – 6599
SEQ ID NO:448	TGCACAATCTGCATCTGCCA	6587 – 6606
SEQ ID NO:449	CAATCTGCATCTGCCACTTTA	6591 – 6612
SEQ ID NO:450	CCACTTTAAACCACATCAGAT	6604 – 6623
SEQ ID NO:451	TAAAATTACTCTTACCACTGATG	6683 – 6705
SEQ ID NO:452	TTCTACTATTTGGAAAAT	6731 – 6749
SEQ ID NO:453	CCTTACCTTGCCTCTACTGCTAGTT	6761 – 6786
SEQ ID NO:454	ATATAGGTTATTAAAAATTCA	6797 – 6818
SEQ ID NO:455	CGATGCCCTGCACAGCCC	6836 – 6854
SEQ ID NO:456	AACACAAGCAAATAAGAAGGCAG	1101 – 1123
SEQ ID NO:457	GAACAGCCGTTGCAAGACATAACAA	1158 – 1183
SEQ ID NO:458	CAGACGAAGTAAACAATTACAGGC	1208 – 1232
SEQ ID NO:459	GGAGAGCAGTGGACAGTGTCCGGACAGC	1238 – 1267
	G	
SEQ ID NO:460	GGTAGATAAACACAATGAACAAAATG	1308 – 1333
SEQ ID NO:461	TCAAGTGGATCTGTATCAGACA	1360 – 1381
SEQ ID NO:462	GCACAGGCAAGTAGTGTAAACCAAA	1399 – 1423
SEQ ID NO:463	GTAATGTAAAAGCAGCATTATTAA	1445 – 1468
SEQ ID NO:464	CAGTATATGGTGTAAAGTTATA	1481 – 1501

HPV 6 NC 000904

SEQ ID NO:	5' → 3'	Locus in HPV 6
SEQ ID NO:465	CATCCGTAAC TACATCTTCC	6814 – 6833
SEQ ID NO:466	ATCCGTAAC TACATCTTCCA	6815 – 6834
SEQ ID NO:467	CTACATCTTCCACATACACCAA	6823 – 6844
SEQ ID NO:468	CATCTTCCACATACACCAAAT	6826 – 6845
SEQ ID NO:469	ATCTTCCACATACACCAAATT	6827 – 6846
SEQ ID NO:470	CCACATACACCAATTCTGAT	6832 – 6851
SEQ ID NO:471	TAGCATTACATTGTCTGCTGAAG	6911 – 6933
SEQ ID NO:472	TCCCTCTGTTTGGAAAGAC	6959 – 6977
SEQ ID NO:473	GTTATCGCCTCCCCAAATGGTACAT	6989 – 7014
SEQ ID NO:474	CTATAGGTATGTGCAGTCACAG	7025 – 7046
SEQ ID NO:475	GCCCACCTCTGAAAAGGAA	7064 – 7082
SEQ ID NO:476	CTATAAGAACCTTAGT	7094 – 7109
SEQ ID NO:477	GGCGGACACCCATTATGCGACTG	1045 – 1067
SEQ ID NO:478	GTTAGCCTATAAACACTATAGCCGA	1106 – 1131
SEQ ID NO:479	CCACGATTGGACGCCATTAAACTTACAAGA	1154 – 1183
SEQ ID NO:480	GGCTGTTCAAACCAGGGAACTAACG	1206 – 1231
SEQ ID NO:481	GGTAGAGAAACATGGCGTACCGGAAA	1279 – 1304
SEQ ID NO:482	GGACACAGGAAGGGACATAGAGGGGG	1327 – 1352
SEQ ID NO:483	CACAAACAGTGTACGGGAGCATGCAG	1378 – 1403
SEQ ID NO:484	GCTAAAATGTAAAGATTACGGGCAG	1426 – 1451
SEQ ID NO:485	GCTTGGGCTGTCTTTATAGATTAA	1476 – 1501

HPV 70 NC 001711

SEQ ID NO:	5' → 3'	Locus in HPV 70
SEQ ID NO:486	TGTCTGCCTGCACCGAAACG	6614 – 6633
SEQ ID NO:487	CTGCACCGAAACCGC	6621 – 6635
SEQ ID NO:488	GAAACGGCCATACCTGCTGT	6628 – 6647
SEQ ID NO:489	CGAAACGGCCATACCTGCTG	6627 – 6646
SEQ ID NO:490	CGGCCATACCTGCTGTATATAG	6632 – 6653
SEQ ID NO:491	CTGTATATAGCCCTACAAAG	6644 – 6663
SEQ ID NO:492	TAATCACATTAAC TGCTGACG	6723 – 6745
SEQ ID NO:493	TCCTGCAATTTGGACAAT	6771 – 6789
SEQ ID NO:494	AGTTACCCCTCCACCATCTGCAAGCT	6801 – 6826
SEQ ID NO:495	GTATAGGTATTACAATCAGCA	6837 – 6858
SEQ ID NO:496	GGATGCTCCTACACCTGAA	6876 – 6894
SEQ ID NO:497	CTATGACGATTAAAAA	6906 – 6921
SEQ ID NO:498	GGCCCAAAGGGATGCACAATCAG	1149 – 1171
SEQ ID NO:499	GCAATCTAAATAAAAGTCCTTGT	1202 – 1224
SEQ ID NO:500	GTACATAGGAAACAAAGGGTAACAC	1240 – 1264
SEQ ID NO:501	GGTAAACATATGCAATAAACAGG	1278 – 1300
SEQ ID NO:502	ACAAACGTGTATTCACTGACAGACAGCGGC	1306 – 1335
SEQ ID NO:503	GTAGTAATAATACAAATGGGGAAAGA	1378 – 1403
SEQ ID NO:504	GGAGTCAGTAGTGTAGACAGTGCTA	1446 – 1471
SEQ ID NO:505	TCCACAGTCACCTACTGCACAGCTAA	1491 – 1516
SEQ ID NO:506	GCTAATAACCAAAAAGCCATACTAC	1531 – 1555
SEQ ID NO:507	CACACATATGGATTAGCATTAAACGA	1570 – 1595

HPV 72 X94164

SEQ ID NO:	5' → 3'	Locus in HPV 72
SEQ ID NO:508	ATCTGTTGGTTAACATGAGCT	6759 – 6778
SEQ ID NO:509	TTTGTGACAGTTGTAGATAC	6780 – 6799
SEQ ID NO:510	CTGCCACAGCGTCCT	6829 - 6843
SEQ ID NO:511	ACAGCGTCCTCTGTATCAGA	6834 – 6853
SEQ ID NO:512	CCACAGCGTCCTCTGTATCA	6832 – 6851
SEQ ID NO:513	AGCGTCCTCTGTATCAGAATAT	6836 – 6857
SEQ ID NO:514	CAGAATATACAGCTTCTAAT	6850 – 6869
SEQ ID NO:515	TAAAATTCACTAACCTCTGAAA	6929 – 6951
SEQ ID NO:516	TAAGGCCTTATTGGATGAC	6977 – 6995
SEQ ID NO:517	TGTGGTGCCTCCTCCTTCTACCAAGTT	7007 – 7032
SEQ ID NO:518	CTATAGGTTTTGCAGTCTCGT	7043 - 7064
SEQ ID NO:519	GGGGGCTGCCACCCCTCCTCCT	7082 – 7103
SEQ ID NO:520	ATATGCTAACTTATCC	7115 – 7130

HPV 74 U40822

SEQ ID NO:	5' → 3'	Locus in HPV 74
SEQ ID NO:521	CCTACCTCACAAATCG	1686 – 1700
SEQ ID NO:522	CTCACAAATGCCTTCTGCTA	1691 – 1710
SEQ ID NO:523	ACCTCACAAATGCCTTCTGC	1689 – 1708
SEQ ID NO:524	CAATGCCTTCTGCTACATATA	1695 – 1716
SEQ ID NO:525	ACAATGCCTTCTGCTACATAT	1694 – 1715
SEQ ID NO:526	CTACATATAATAGTTAGAC	1708 – 1727
SEQ ID NO:527	TAGTATTAAGTTAACTGCTGAGG	1787 – 1809
SEQ ID NO:528	TCCTACAGTTTAGAAGAG	1835 – 1853
SEQ ID NO:529	GCTAACGCCTCCCCCAATGGTACTT	1865 – 1890
SEQ ID NO:530	CTACAGATATGTGCAGTCCCAG	1901 – 1922
SEQ ID NO:531	ACCTACGCCTGATAAAGCA	1940 – 1958
SEQ ID NO:532	CTATGCAAATTAAAGT	1970 – 1985

HPV 82 AB027021

SEQ ID NO:	5' → 3'	Locus in HPV 82
SEQ ID NO:533	TGCTGTTACTCCATC	6608 – 6622
SEQ ID NO:534	TGCTGTTACTCCATCTGTTG	6608 – 6627
SEQ ID NO:535	ACTCCATCTGTTGCACAAAC	6615 – 6634
SEQ ID NO:536	AAACATTTACTCCAGCAAAC	6631 – 6650
SEQ ID NO:537	TAAAATCACTTTAACTACTGAAA	6710 – 6732
SEQ ID NO:538	TTCTACAAATTTAGAACAG	6758 – 6776
SEQ ID NO:539	ATTAACATTGCCCTCCGCTAGTT	6788 – 6813
SEQ ID NO:540	CTATCGATTGTAAAAATGCA	6824 – 6845
SEQ ID NO:541	GGACAGTCCTCCACAGGCT	6863 – 6881
SEQ ID NO:542	AACACAGGCACACAAAGAGGGCTG	1094 – 1116
SEQ ID NO:543	GCAGCCCATTAAAAGACATTACAAA	1156 – 1180
SEQ ID NO:544	GTCAGCAACAAACAAAACAGGCAAACCT	1201 – 1230
	TC	
SEQ ID NO:545	GGAGATTACTGGACAGTTATCCGGACA	1243 – 1269
SEQ ID NO:546	CCTTACAGGTAGATGGCAAAATGAC	1309 – 1334
SEQ ID NO:547	GAGCAGCGACAGAAAGTACAGAGATAG	1367 – 1392
SEQ ID NO:548	GCTACCAATGTAGGACTAACAGTA	1413 – 1437
SEQ ID NO:549	GTAGCAATGAAAAGCAATGTTATG	1456 – 1481
SEQ ID NO:550	GGTGTAGTTATAATGAGTTGGTAAG	1503 – 1528

5

HPV CP8061 U12479

SEQ ID NO:	5' → 3'	Locus in HPV CP8061
SEQ ID NO:551	TCTGTGCTACCAAAACTGTT	86 – 105
SEQ ID NO:552	CTACCAAAACTGTTG	92 – 106

SEQ ID NO:553	ACCAAAACTGTTGAGTCTAC	94 – 113
SEQ ID NO:554	AACTGTTGAGTCTACATATAAA	99 – 120
SEQ ID NO:555	GTTGAGTCTACATATAAAAGC	103 – 122
SEQ ID NO:556	CTACATATAAAAGCCTCTAGT	110 – 129
SEQ ID NO:557	TGTTATTAAATTAACAGCTGAAA	189 – 211
SEQ ID NO:558	TGCTACATTACTGGAGGAC	237 – 255
SEQ ID NO:559	GTTCTTACCAACCTCTACTG	267 – 286
SEQ ID NO:560	CTACCGCTTTTACAGTCTCAG	303 – 324
SEQ ID NO:561	AAACAGTCCTCCTCCTGCAGAA	342 – 363
SEQ ID NO:562	CTATGCAGATCTTACA	375 – 390

HPV CP8034 U12480

SEQ ID NO:	5' → 3'	Locus in HPV CP8034
SEQ ID NO:563	CAGCTACATCTGCTG	92 – 106
SEQ ID NO:564	GCTACATCTGCTGCTGCAGA	94 – 113
SEQ ID NO:565	ACATCTGCTGCTGCAGAATACA	97 – 118
SEQ ID NO:566	TGCTGCAGAATACAAGGCCT	105 – 124
SEQ ID NO:567	GCTGCAGAATACAAGGCCTC	106 – 125
SEQ ID NO:568	CAGAATACAAGGCCTCTAAC	110 – 129
SEQ ID NO:569	TAAAATACAGTTAACACCAGAAA	189 – 211
SEQ ID NO:570	CAAGGCACTGTTGGATGAT	237 – 255
SEQ ID NO:571	TGTGTTGCCACCTCCTCCACCAGTT	267 – 292
SEQ ID NO:572	ATATCGCTTTTACAGTCTCGG	303 – 324
SEQ ID NO:573	GGGTGCTGCTGCCCTGCGCCC	342 – 363
SEQ ID NO:574	TTATGCCGACATGTCA	375 – 390

5 HPV L1AE5 AF039910

SEQ ID NO:	5' → 3'	Locus in HPV L1AE5
SEQ ID NO:575	ATCTACTGCAACTACTAAC	69 – 88
SEQ ID NO:576	CTGCAACTACTAAC	74 – 88
SEQ ID NO:577	CTGCAACTACTAACATCCAGTT	74 – 93
SEQ ID NO:578	ACTACTAACATCCAGTTCCATCTA	79 – 100
SEQ ID NO:579	CTAACCTCCAGTTCCATCTATA	83 – 102
SEQ ID NO:580	CTATATATGAACCTCTAAA	98 – 117
SEQ ID NO:581	TAAAATTACACTTACTACTGATG	177 – 199
SEQ ID NO:582	TCCTACTATTTAGATAGT	225 – 243
SEQ ID NO:583	TGTTAGTCCTCCCCATCTGCTAGCT	255 – 280
SEQ ID NO:584	ATATAGGTTTTACAGTCATCT	291 – 312
SEQ ID NO:585	GGATGTGGTTGTTCCACAA	330 – 348

HPV MM4 U12488

SEQ ID NO:	5'→ 3'	Locus in HPV MM4
SEQ ID NO:586	CTGCTGTTACTCAATCTGTT	92 – 111
SEQ ID NO:587	TGCTGTTACTCAATC	93 – 107
SEQ ID NO:588	GTTACTCAATCTGTTGCACA	97 – 116
SEQ ID NO:589	TGCACAAACATTACTCCAG	111 – 130
SEQ ID NO:590	TTACTCAATCTGTTGCACAAAC	98 – 119
SEQ ID NO:591	AAACATTACTCCAGCAAAC	116 – 135
SEQ ID NO:592	TAAAATCACTTTAACTACTGAAA	195 – 217
SEQ ID NO:593	TTCTACAAATTAGAACAG	243 – 261
SEQ ID NO:594	ATTAACCTTGCCCCCTCAGCTAGTT	273 – 298
SEQ ID NO:595	CTATCGATTGTAAAAATGCA	309 – 330
SEQ ID NO:596	GGACAGTCCTCACAGGCT	348 – 366

5 HPV MM7 U12489

SEQ ID NO:	5'→ 3'	Locus in HPV MM7
SEQ ID NO:597	TGCTGCTACACAGGC	93 – 107
SEQ ID NO:598	GCTGCTACACAGGCTAATGA	94 – 113
SEQ ID NO:599	TGCTACACAGGCTAATGAAT	96 – 115
SEQ ID NO:600	CTACACAGGCTAATGAATACAC	98 – 119
SEQ ID NO:601	ATGAATACACAGCCTCTAAC	110 – 129
SEQ ID NO:602	CAAAATACATCTTACCCCTGAAA	189 – 211
SEQ ID NO:603	TGAACATTATTGGATGAG	237 – 255
SEQ ID NO:604	CGTGTACCACCTCCTCCACCAGCC	267 – 292
SEQ ID NO:605	CTATCGCTATCTGCAGTCCCCT	303 – 324
SEQ ID NO:606	GGGTCCCTCCGCCCTGCCCT	342 – 363
SEQ ID NO:607	TTATGATGGCCTTGTAA	375 – 390

HPV MM8 U12490

SEQ ID NO:	5'→ 3'	Locus in HPV M[M8]
SEQ ID NO:608	TGCTACCAACACCGA	93 – 107
SEQ ID NO:609	CTACCAACACCGAATCAGAA	95 – 114
SEQ ID NO:610	CCAACACCGAATCAGAAATATAA	98 – 119
SEQ ID NO:611	CAGAATATAAACCTACCAAT	110 – 129
SEQ ID NO:612	TAAGGTCCGTCTGACTCCAGAGG	189 – 211
SEQ ID NO:613	TGACTCCTTATTAGATGAG	237 – 255
SEQ ID NO:614	TGTTGTGCCCTCCCTCCACAAGTT	267 – 292
SEQ ID NO:615	CTATAGGTACTTGCAGTCTCGC	303 – 324

SEQ ID NO:616	GGGGGCCGCCGCCAAGCCT	342 – 363
SEQ ID NO:617	TTATGCTGGCATGTCC	375 – 390

wherein the sequence of said first oligonucleotide is selected from one of the sequence group corresponding to said first subtype of human papilloma virus and complementary sequences thereof, and the sequence of said second oligonucleotide is selected from one of the sequence group corresponding to said second subtype of human papilloma virus and complementary sequences thereof.

- 5 5. The detector according to claim 4, wherein said detector is an oligonucleotide chip.
6. A method for simultaneously detecting and identifying subtypes of human papilloma viruses contained in a sample, comprising steps of:

10 providing a first oligonucleotide and a second oligonucleotide for respectively hybridizing with a first and a second subtypes of human papilloma viruses;

hybridizing deoxyribonucleic acid (DNA) contained in said sample with said first and second oligonucleotides; and

removing nonhybridized DNA,

15 thereby said subtypes of human papilloma viruses contained in said sample are detected and identified.

7. The method according to claim 6, wherein said DNA contained in said sample is the product of polymerase chain reaction (PCR).
8. The method according to claim 6, wherein said DNA contained in said sample has signaling substances labeled thereon.
- 20 9. The method according to claim 8, wherein said signaling substance is biotin.
10. The method according to claim 9 further comprising a step of performing a reaction of biotin and avidin-alkalinephosphatase.
11. The method according to claim 8, wherein said signaling substances are fluorescent substances.
- 25 12. The method according to claim 11, wherein said fluorescent substance is Cyanine 5.

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wherein the sequence of said first oligonucleotide is selected from one of the sequence group corresponding to said first subtype of human papilloma virus and complementary sequences thereof, and the sequence of said second oligonucleotide is selected from one of the sequence group corresponding to said second subtype of human papilloma virus and complementary sequences thereof.

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5. The detector according to claim 4, wherein said detector is an oligonucleotide chip.
6. A method for simultaneously detecting and identifying subtypes of human papilloma viruses contained in a sample, comprising steps of:

providing a first oligonucleotide and a second oligonucleotide for respectively hybridizing with a first and a second subtypes of human papilloma viruses;

10 hybridizing deoxyribonucleic acid (DNA) contained in said sample with said first and second oligonucleotides; and

removing nonhybridized DNA,

15 thereby said subtypes of human papilloma viruses contained in said sample are detected and identified.

7. The method according to claim 6, wherein said DNA contained in said sample is the product of polymerase chain reaction (PCR).

8. The method according to claim 6, wherein said DNA contained in said sample has signaling substances labeled thereon.

20 9. The method according to claim 8, wherein said signaling substance is biotin.

10. The method according to claim 9 further comprising a step of performing a reaction of biotin and avidin-alkalinephosphatase.

11. The method according to claim 8, wherein said signaling substances are fluorescent substances.

25 12. The method according to claim 11, wherein said fluorescent substance is Cyanine 5.

13. A method for detecting a subtype of human papilloma viruses contained in a sample, comprising steps of:

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providing an oligonucleotide complementary to a sequence specific to said subtype of human papilloma viruses;

hybridizing said oligonucleotide with deoxyribonucleic acid (DNA) contained in said sample;

5 removing non-hybridized DNA contained in said sample; and

detecting hybridized DNA to show whether said subtype of human papilloma viruses contained in said sample,

wherein said sequence specific to said subtype of human papilloma viruses is selected from following:

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HPV subtype	Accession number/bp	loci /bp
HPV 11	NC 001525/7931	6727 – 7135/409 1044 – 1509/466
HPV 16	NC 001526/7904	6602 – 7013/412 1089 – 1538/450
HPV 18	NC 001357/7857	6578 – 6992/415 1135 – 1609/475
HPV 26	NC 001583/7855	6553 – 6967/415 1093 – 1522/430
HPV 31	NC 001527/7912	6520 – 6931/412 1083 – 1476/394
HPV 32	NC 001586/7961	6837 – 7245/409 1032 – 1536/505
HPV 33	NC 001528/7909	6559 – 6967/409 1100 – 1532/433
HPV 35	NC 001529/7851	6542 – 6953/412 1089 – 1497/409
HPV 37	NC 001687/7421	6711 – 7125/415
HPV 39	NC 001535/7833	6605 – 7019/415 1149 – 1593/445
HPV 42	NC 001534/7917	6802-7210/409 1085-1485/401
HPV 43	U12504/455	21-435/415
HPV 44	NC 001689/7833	6647 – 7061/415 1038 – 1491/454
HPV 45	NC 001590/7858	6582 – 6996/415 1136 – 1567/432
HPV 51	NC 001533/7808	6486 – 6897/412

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HPV 52	NC 001592/7942	1092 - 1506/415 6623 - 7031/409 1085 - 1526/442
HPV 53	NC 001593/7856	6614 - 7022/409
HPV 54	NC 001676/7759	6561 - 6972/412 1013 - 1484/472
HPV 56	NC 001594/7844	6559 - 6967/409
HPV 58	NC 001443/7824	6608 - 7016/409 1104 - 1536/433
HPV 59	NC 001635/7896	6571 - 6985/415 1093 - 1528/436
HPV 61	NC 001694/7989	6732 - 7146/415 1005 - 1515/511
HPV 62	U12499/449	21 - 429/409
HPV 66	NC 001695/7824	6609 - 7017/409 1023 - 1545/523
HPV 67	D21208/7801	6584 - 6992/409 1096 - 1504/409
HPV 68	M73258/6042	2582 - 2996/415 4990 - 5350/361
HPV 69	NC 002171/7700	6509 - 6923/415 1101 - 1518/418
HPV 6	NC 000904/8012	6743 - 7151/409 1045 - 1510/466
HPV 70	NC 001711/7905	6549 - 6963/415 1149 - 1608/460
HPV 72	X94164/7988	6758 - 7172/415
HPV 74	U40822/3891	1613 - 2027/415
HPV 82	AB027021/7871	6536 - 6950/415 1094 - 1532/439
HPV CP8061	U12479/452	21 - 432/412
HPV CP8304	U12480/452	21 - 432/412
HPV L1AE5	AF039910/364	11 - 360/350
HPV MM4	U12488/455	21 - 435/415
HPV MM7	U12489/452	21 - 432/412
HPV MM8	U12490/452	21 - 432/412

3/27/02
**METHOD AND DETECTOR FOR IDENTIFYING SUBTYPES OF HUMAN PAPILLOMA-
VIRUSES**

ABSTRACT OF THE DISCLOSURE

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